Remarks

This responds to the Office Action of December 4, 2003. Reconsideration of the application is respectfully requested.

Claims 15-57 have been rejected under 35 U.S.C. § 102(e) on the basis of U.S. Patent No. 6,300,765 to Chen. This rejection is respectfully traversed.

Claim 15 requires the act of: "calculating a difference between the first and second measurements to determine the cross-coupling capacitance between the first and second wires." This is simply not done in Chen. The operation of Chen is understood as follows from the discussion at Col. 5, line 45 of Chen through Col. 7, line 19.

During an initial reset phase, a transistor 120 is on while a transistor 119 is off (Col. 5, lines 53,54). A discharge current I_{DCHRG2} flows from interconnect 105 to ground 129. This removes any pre-existing charge on the interconnect. In addition, transistor 113 is on and transistor 112 is off (Col. 5, lines 65,66). As a result, any pre-existing charge on the target interconnect (e.g., 106-n) is removed. That is, under these conditions, a discharging current I_{DCHRG1} is drawn to remove the pre-existing charge. No measurement takes place during the reset phase.

During an off phase, no charging occurs and all of the transistors 119, 120, 112 and 113 are off (Col. 6, lines 11,12).

During an enable phase, the transistor 112 is on while transistors 119, 120 and 113 are off (Col. 6, lines 18,19). This enables the test structure for measuring the target interconnection capacitance c_n.

During a measure phase, transistor 119 is on while transistor 120 is off (Col. 6, lines 26,27). A charging current I_{CHRG2} is drawn through transistor 119 to a test interconnect. This places a desired charge $(c_n)(V_{DD})$ on the test interconnect. An equal but opposite charge - $(c_n)(V_{DD})$ is induced on the target interconnect 106-n. Transistor 112 remains on. A measurable charging current I_{CHRG1} is drawn from the target interconnect through the current meter 138. A current measurement is made with the current meter during this phase.

During a disable phase, transitions 119 and 120 are off (Col. 6, line 47) so that no charge is placed on test interconnect 105. Transistor 112 remains on and the measurable charging current I_{CHRG1} is still measured.

Another off phase follows during which all of the transistors are off (Col. 6, lines 60,61). This completes the measurement of the charging current I_{CHRG1} for the particular cycle.

This process is repeated over more measurement cycles to a measurement of the average current I_{AVG} for the measurable charging current I_{CHRG1}.

Equation (1) at Col. 7, of Chen, indicates the integration provides a measurement of the average current I_{AVG}.

Formula (2) in Col. 7, of Chen, states how Chen computes his target interconnect capacitance c_n.

This formula is recited as follows:

$$c_n = \frac{I_{AVG}}{(V_{DD})(F_{CHRG1}/M)M}$$

In the above formula, F_{CHRG1}/M is the measurement of the frequency of the measure control signal and M is a factor (see frequency divider 127 in Col. 4, line 65). There is no "difference" calculation in this Chen formula to determine c_n.

Thus, in formula used by Chen for calculating the target interconnect capacitance, there is no difference being calculated between first and second measurements to determine cross-coupling capacitance between first and second wires as required by claim 15.

The only measurement taking place in Chen is a measurement of current from the charge on interconnects such as interconnect 106-n. There is no calculation of a difference between first and second measurements.

Therefore, claim 15 should be in condition for allowance.

Claims 16-34 depend directly or indirectly upon claim 15 and should be allowable for the above reasons. In addition, each of these dependent claims sets forth an independently patentable combination of method acts.

Claim 35 is directed toward a circuit for measuring cross-coupling capacitance. In addition to other requirements, claim 35 requires "wherein the cross-coupling capacitance is measured between the first and second wires by subtracting two capacitance-related measurements associated with the first wire, one of the measurements being performed with the second wire at a first voltage level and the other of the measurements being performed with the second wire charged to a second voltage level."

Chen does not subtract two capacitance-related measurements associated with the first wire as required by claim 35. This is apparent from Formula (2) in Col. 7 of Chen.

Therefore, claim 35 should be in condition for allowance.

Claims 36-46 depend directly or indirectly upon claim 35 and should be allowable for the above reasons. In addition, these claims should be allowable because they each set forth independently patentable combination of elements.

Claim 47 is directed toward a circuit comprising, in addition to other elements, "means for calculating a cross-coupling capacitance by measuring charge needed to charge the first wire to a pre-determined voltage with the second wire grounded and measuring charge needed to charge the first wire to the pre-determined voltage with the second wire charged to the pre-determined voltage and taking a difference between the two measurements."

Chen is not understood to measure the charge needed to charge a first wire to a pre-determined voltage with a second wire grounded and measuring the charge needed to charge the first wire to the pre-determined voltage with the second wire charged to the pre-determined voltage and taking a difference between the two measurements.

Therefore, claim 47 should be in condition for allowance.

Claims 48-50 each depend from claim 47 and should be allowable for the reasons given above in support of their parent claim. In addition, these claims are each independently patentable.

Claim 51, in addition to other requirements, is directed toward a method which requires "calculating a difference between the first and second charge to determine the cross-coupling capacitance."

The two formulas set forth in Col. 7 in Chen for determining the average current and computing interconnect capacitance do not calculate a difference between first and second charges to determine cross-coupling capacitance.

Therefore, claim 51 should be in condition for allowance.

Claims 52-57 each depend on claim 51 and should be allowable for the reasons given above in support of their parent claim. In addition, each of these claims is independently patentable as they each set forth an independently patentable combination of method acts.

Therefore the application should be in condition for allowance and such action is respectfully requested.

Respectfully submitted,

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